Swiss Patent No. 476 891

SWISS CONFEDERATION
FEDERAL OFFICE FOR INTELLECTUAL PROPERTY
PATENT NO. 476,891
PRINCIPAL PATENT

Int. Cl.:	D 06 n 3/00 B 32 b 5/26
Filing No.:	8626/66
Filing Date:	June 15, 1966 6:15 pm
Priority	
Date:	June 22, 1965
Country:	Germany
No.:	H 56358 VII a/8 h
Application Laid Open:	March 31, 1969
Patent Granted:	August 15, 1969
Patent Published:	September 30, 1969

FLOOR COVERING TILES

Inventor:	Theodor Schuette and Dr. Harald Reimers, Bremen (Germany)
Applicant:	Hansawerke Lürman, Schuette & Co., Bremen (Germany)
Agent:	Bovard & Cie., Bern

Publications cited:

French Patent No. 1 278 058
USA Patent Nos. 2 261 096;
2 763 587

Corresponds to Published Examined Application No. 8626/66

The invention under consideration refers to floor covering tiles made of textile materials, which can be laid without cementing and which contain at least a fraction of nonwoven textile fibers.

Putting together floor coverings from mostly square-shaped carpet cuttings is known, for example, from US Patent No. 2 763 587. Up to now, however, it was necessary to cement these shaped cuttings firmly to the floor, because the individual shaped cuttings shifted with respect to one another, and furthermore became "twisted out of shape" because of weather influences. The advantages with respect to blending, transporting and laying which arose from the processing of relatively small shaped covering cuttings were thus opposed by the serious disadvantage of cementing, which, moreover, prevented the exchanging of individual, damaged, shaped cuttings. It was precisely in this, however, that one could find a special advantage in a floor covering consisting of individual, shaped cuttings.

For these reasons, it was not possible to introduce floor coverings consisting of tile-like, shaped cuttings of textile material, in contrast to coverings consisting of plastic plates or the like.

French Patent No. 1 278 058 describes tiles for the production of floor coverings, which can be laid without cementing. These files consist of the actual floor covering, consisting of pliable nonslip material, whose surface is provided with a covering, made of textile material, which reaches around the side edges into a part of the base surface. Such tiles must be produced individually, and continuous production in the textile industry on the usual and existing apparatuses is impossible.

US Patent No. 2 261 096 describes a floor covering material, consisting of a web-reinforced, adhesive needlefelt, for example, strengthened with rubber latex, and a method for its production. One cannot find any ideas on stiffening the needlefelt until dimensional stability is attained in this patent, and there is no information at all on a backing, which is indispensable to attain treading elasticity, heat insulation, and slip resistance. On the one hand, it would not be possible to cut such sheeting material into shaped cuttings and lay them, as tiles, without cementing them to a floor covering, and on the other hand, a suitable base would have to be present in any case--that is, even when laying the uncut sheeting.

The goal of the invention under consideration is to overcome these shortcomings and to create the possibility of putting together floor coverings from shaped cuttings containing textile materials, without requiring cementing of these shaped cuttings to the floor.

In accordance with the invention, this is attained by floor covering tiles, in which the textile material is stiffened by a moisture-resistant binder until dimensional stability is attained, and which are provided with an elastic, nonslip backing made of high molecular weight material with a weight per unit area of 1500 g/m^2 and above.

Surprisingly, it has been shown that a floor covering, composed of the floor covering tiles in accordance with the invention, can in fact be exposed to all normally occurring stresses, without deformation, shifting, or other change of the individual tiles with respect to one another. Rather, the closed structure of the floor covering is always retained. Nevertheless, each individual tile can be taken out readily, without a tool, and replaced by another tile of the same size. In this way, for example, a soiled or scorched tile can be exchanged for a new one, without making the whole covering useless. It is also possible to replace particularly worn tiles for less worn ones on a regular replacement basis, and thus to attain a uniform wearing out of the covering with the result of a service life which is longer as a whole. Finally, the cementing-free laying of the described tiles permits a change in the pattern of the floor and an adaptation to special wishes or changing circumstances in the furnishing of the room.

In this connection, one should point out that in spite of their excellent treading elasticity, the described tiles are not deformed in use in a way which would place the cohesion of the structure in doubt.

Basically, all natural, semisynthetic and completely synthetic fibers are suitable for the production of the described tiles, but the fibers influence "deformation" under changing climatic conditions. Among the completely synthetic fibers, those made of polypropylene and polyacrylonitrile exhibit the least tendency to a change in length or width under changed climatic conditions.

Advantageously, the binder is a mixture of polyvinyl acetate and natural and/or synthetic rubbers in a proportion of 10:1 to 10:5, preferably, 10:2 to 10:3. Surprisingly, a mixture of a polyvinyl acetate dispersion and natural and/or synthetic rubber latex exhibits, namely, an optimal strength and very good resistance not only with respect to boiling water, but also with respect to the organic solvents used in dry cleaning.

The backing, which is advantageously applied in the same operation as the binder during the production of the described tiles, which is indicated by way of example, preferably consists of natural or synthetic rubber or high molecular weight plastics, such as polyurethane, polyvinyl acetate, polyvinyl chloride, polyacrylonitrile, or a mixture thereof. It can be foamed, for example. This foaming can be done either with air or by the addition of a propellant which is, in fact, known. Preferably the foamed backing is compressed to the entire area and perhaps embossed in a relief-like manner.

To increase the uniformity in the longitudinal and transverse direction, in particular with regard to the change in length also, under changing climatic conditions, it is recommendable to carry out the drying or vulcanization of the backing composition under as low as possible a stress of the textile material, during the production of the described tiles, which is indicated by way of example.

An intermediate layer can also be present between the textile material and backing, which runs, to some extent, in the textile material, and consists of water-insoluble synthetic resin and/or synthetic rubber.

The structure of the described tiles is illustrated below with various examples, which describe the production of the floor coverings, cut into pieces in the end. The parts and percentages refer to the weight.

Example 1

A transversely laid nonwoven fleece, consisting of completely synthetic fibers, with a square meter weight of 750 g, is laid on a jute fabric with a square meter weight of 150 g, needle-punched in the usual manner, impregnated with a binder on a padding machine, and squeezed to such an extent that a solid content of 25% results. A dispersion of the following:

25 parts polyvinyl acetate
6 parts plasticizer
14 parts SBR rubber
20 parts chalk
235 parts water

---

300 parts

is used as a binder. 2000 g/m^2 of a composition, which is composed of the following:

160 parts rubber latex
3 parts zinc oxide
1.5 parts vulcanization accelerator
3 parts sulfur
1.5 parts anti-aging agent
50 parts chalk
1 part stearic acid
2 parts thickener, for example, "Latecoll" D
1.5 parts ammonium chloride

are applied on the material which is still moist.

This coating is gelled in an infrared field and subsequently embossed with an embossing roller, so that a uniform pattern results. Afterward, the material passes through a vulcanization oven, heated with hot air, and is vulcanized at 130°C for 20 min. The floor covering thus obtained exhibits good slip resistance and excellent stability.

Example 2

A textile, flat-shaped article, produced according to Example 1 and made of a jute fabric and a fibrous nonwoven, is strengthened by impregnation as in Example 1 and subsequently coated with 1500 g/m^2 of a composition, foamed with two to three times the quantity of air, consisting of the following:

160 parts rubber latex
3 parts zinc oxide
1.5 parts vulcanization accelerator
3 parts sulfur
1.5 parts anti-aging agent
50 parts chalk
5 parts sodium oleate
2 parts sodium hexafluorosilicate or ammonium chloride

in an infrared-heated field, compressed and embossed by means of an embossing calender, and vulcanized at 130° for 25 min. The backing thus obtained exhibits a foam structure and imparts to the covering an additional softness and treading sound insulation, aside from a slip resistance.

Example 3

A textile, flat-shaped article, produced as in Example 1 and made of a fabric of refuse wool and a formed fabric of polyamide fibers, is coated, after impregnation as in Example 1 without intermediate drying, with 2000 g/m^2 of a composition consisting of the following:

160 parts rubber latex
100 parts polyvinyl acetate dispersion (50%)
1.5 parts vulcanization accelerator
1.5 parts anti-aging agent
3 parts sulfur
5 parts zinc oxide
5 parts sodium oleate
3 parts sodium hexafluorosilicate or ammonium chloride,

which was foamed beforehand with three times the volume of air. This composition is gelled in the infrared field as in Example 1 and vulcanized at 130° for 25 min.

Example 4

A similar flat-shaped textile article is impregnated and strengthened just as in Example 2, and subsequently coated with 1500 g/m^2 of a composition, consisting of the following:

100 parts polyvinyl chloride powder
50 parts dioctyl phthalate
25 parts dioctyl sebacate
5 parts inflating agent
1 part stabilizer,

gelled at 160°C for 10 min and afterwards, embossed with a cooled, patterned roller.

Example 5

A flat-shaped textile article, produced and impregnated as in Example 1, is strengthened after impregnation by heat effects. Subsequently, a composition consisting of the following:

6 parts natural rubber
10 parts polyvinyl acetate
50 parts chalk
34 parts water

is doctored onto the reverse side. This preliminary coating is predried partially by infrared radiation, and the dried surface is coated with 1500 g/m^2 of a composition, foamed with three times the quantity of air as described in Example 3. After gelling by an infrared effect, the foam layer is compressed to 1/3 its original thickness by passing under an embossing roller, and at the same time, it is provided with a pattern. Vulcanization takes place at 130°C in 20 min.

Claim

Floor covering tiles made of textile material, which can be laid without cementing, and which contain at least a fraction of nonwoven textile fibers, characterized in that the textile material is stiffened by a moisture-resistance binder until dimensional stability is attained, and it is provided with an elastic, nonslip backing made of a high molecular weight material with a weight per unit area of 1500 g/m^2 and over.

Subclaims

1. Floor covering tiles according to the patent claim, characterized in that the binder is a mixture of polyvinyl acetate and natural and/or synthetic rubbers, in a proportion of 10:1 to 10:5, preferably 10:2 to 10:3.

2. Floor covering tiles according to the patent claim, characterized in that the backing is made of a foamed material.

3. Floor covering tiles according to the patent claim or Subclaim 2, characterized in that the backing is made of natural or synthetic rubber or high molecular weight plastics, such as polyurethane, polyvinyl chloride, polyvinyl acetate, polyacrylonitrile, or a mixture thereof.

4. Floor covering tiles according to the patent claim, characterized in that an intermediate layer is present between the textile material and the backing; the intermediate layer runs in the textile material, to some extent, and is made of a water-insoluble synthetic resin and/or a synthetic rubber.

5. Floor covering tiles according to Subclaim 2, characterized in that the foamed backing is compressed on the total area and is embossed in a relief-like manner.

6. Floor covering tiles according to the patent claim, characterized in that the textile material consists of a fabric and a formed fabric, needle-punched onto it.